UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MAR 11 1988

Dr. James R. Campbell, Ph.D.
Program Manager, Previously Owned Properties
Keystone Environmental Services, Inc.
436 Seventh Avenue, Suite 1940
Pittsburgh, PA 15219

Re: Draft Remedial Investigation Report
for the South Cavalcade Site

Dear Dr. Campbell:

I am writing you to transmit the final set of EPA comments on the draft Remedial Investigation report. These comments were discussed at the February 19, 1988, meeting with you and your consultant. At the meeting, we gave you two sets of comments: one developed by my staff and the other by the EPA technical oversight consultants. Today's transmittal consolidates these comments.

I understand that you are already revising the draft report in response to our comments. I suggest that, after you have finished a section of the report, you send that section to EPA for review. I want to emphasize that we will need agreement on the factual issues in the Remedial Investigation report no later than mid-April so that you can meet the June 13, 1988, delivery date for the draft Feasibility Study report.

Please call Jim Pendergast of my staff at (214) 655-6735 to discuss any questions about these comments.

Sincerely yours,

Larry D. Wright, Chief
Superfund Enforcement Section

Enclosure

cc: D. Sorrels, TNC
L. Mays, CDM

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EDITORIAL COMMENTS ON VOLUME 1 OF THE DRAFT RI REPORT

No	Page	Par	Line	Comment
1	----	-	---	Add a list of acronyms.
2	vi	2	---	Add discussion about general ground water flow direction.
3	x	2	---	Correct the range of copper concentrations.
4	xiii	-	---	Replace the column headings for "Maximum Detected Concentrations" with "Maximum Sample".
5	xvi	2	4	Replace "two" with "one".
6	xvii	1	---	Correct the discussion to note that there was an increase in downwind concentrations for phenol, as stated on page 8-17.
7	All Figures			All the figures using the plan map as the template were not very clear. To improve this, erase the figure behind the "Notes:", "Legend", and numbers for clarity. Furthermore, the site boundaries should be more distinct. Shaded areas should not be superimposed; the clarity is lost in reproduction.
8	1-1	-------		The text should begin by describing the purpose of the report, how and why the study was initiated by Koppers who the PRPs are. The draft report seems to imply that the North Cavalcade site is more of interest; put the emphasis here on the South Cavalcade site. Section 1.4 could be modified as appropriate and moved to the beginning of the chapter.
9	1-1	2	---	Add a paragraph to discuss the areas surrounding the site.
10	1-3	Tab 1-1		The date of Meridian ownership does not agree with the date on Figure 1-2. Make the appropriate correction.
11	1-14	2	1	Also reference this work as the McClelland Study.
12	1-14	3	3	Reword "PRP criteria adopted by EPA" to better express what you are meaning.
13	1-14	Bullets		Define "Level A".
14	1-15 3-11	4 2	1 --	Add the Work Plan to the Appendices if you reference it. -ditto-
15	1-18	1	--	The numbers do not total: 21+9 does not equal 29+2.

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EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
16	1-19	1	2	Delete "general" and "generally".
	3-1	2	2	" " " "
	3-1	3	1	" " " "
	3-2	2	1	" " " "
	3-2	4	1	" " " "
	3-16	4	2	" " " "
	3-21	3	3	" " " "
	3-21	3	16	" " " "
	3-25	2	3	" " " "
	3-25	4	7	" " " "
	3-27	2	7	" " " "
	3-27	3	2	" " " "
	3-31	1	3	" " " "
	3-31	3	2	" " " "
	3-31	4	1	" " " "
	3-32	1	2	" " " "
	3-32	1	4	" " " "
	3-32	3	2	" " " "
	3-34	2	1	" " " "
	3-34	4	2	" " " "
	4-25	4	1	" " " "
	4-34	2	4	" " " "
	5-8	2	1	" " " "
	5-8	2	10	" " " "
	5-9	3	9	" " " "
	5-22	4	2	" " " "
	5-25	4	2	" " " "
	8-1	1	6	" " " "
17	2-4	5	5	Identify who reported the subsidence.
18	2-10	5	1	Replace "1986" with "1987".
19	2-13	3	---	Identify the median income and age groups. This information is available from the census and also from the North Cavalcade RI report.
20	Figure 2-1			The arrow pointing to the site implies that the site is only a small part of the actual site. Move the arrow to the border of the site, and emphasize the site boundaries.
21	Figure 2-3			The soil map should extend farther north and the soil units should be defined in a key.
22	Figure 2-5			The map does not clearly distinguish the industrial and mixed residential areas. The shaded area should be defined on the figure.
23	3-1	-------		The plans should be referenced.
24	Section 3.4			Add discussion of the depths to which anomalies can be resolved and the general advantages/disadvantages of each method.

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EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
25	3-3	1	1	Describe why the Lee Modification was used for the resistivity survey (paragraph 1)? Identify what the apparent resistivity data (paragraph 5) is compared to.
26	3-5			A fifth item should be added concluding that the EM profiling method is the most appropriate for the site and was selected.
27	Section 3.4.2			Add a map showing station locations and conductivity results to help the reader draw the same conclusions that the text does.
28	Table 3-1			Areas A24 through A26 are not off-site background according to Figure 3-2. Section 3.5.2 should also be modified to reflect this.
29	3-7	2	4	Define "aerial photography anomaly areas".
30	3-11			Were the samples composited, and if so, at what lengths? From what intervals were samples collected and, considering that an average of one sample was obtained from each boring, how were the selection criteria prioritized?
31	3-13	2	5	Describe the criteria used to determine whether soil odors and oily residues were present.
32	Figure 3-4			Note number 4 is incorrect as no wells contain the CAV prefix. A note should be added indicating that MW, PO and DW, prefixed wells were drilled as part of the site study. OTERS, should be OTHERS in Legend.
33	3-16	4	9	Insert "necessarily" after "are not".
34	3-17	2	7	Replace "to" with "beyond".
35	3-17	1&2		Reword paragraphs 1 and 2 to report depths relative to the ground surface, the water table or to hydrostratigraphic units to place the lithologies in proper context.
36	Section 3.6.4			Identify the percentage of samples that underwent surrogate testing.
37	3-20	3	3	Replace "two" with "the two upper".
38	3-21	3	4	Add the Field and Sampling Plan to the Appendices if you reference them.
39	3-22	4	--	How were the sections of well casing and screen joined? Were any glues or adhesives used? How far did the sand pack extend above and below the well screen?

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EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
40	3-22	6	--	Discuss the potential volatilization affects of air lift well development on volatile organic concentrations in groundwater near the wells, and the possible impacts on VOC sampling results.
41	Table 3-2			Why aren't wells P06, P07 and C7-0W-01, all listed in Appendix F, Volume 3, presented here? State how the well development purge volumes were calculated.
42	3-25	4	5	Replace the comma with a semicolon.
43	3-26	1	--	What was the source and chemical quality of the injected water? What is the precision and accuracy of the water level indicator devices? How were the raw data reduced? What method was used to calculate hydraulic conductivity?
44	3-29	1&2		Clarify what intervals were plugged. In what ways would pumping fresh water into the borehole have affected aquifer chemistry?
45	Table 3-3			The table is inconsistent with the text referring to this table (Section 3.9, page 3-32).
46	3-33	Tab 3-3		Reword the title to indicate that these are the HSL organics which were sampled during the field work.
47	3-37	3	7	The soil sample QA samples (bottom paragraph) are located in Appendix S, not Appendix Q, Volume 3, as stated.
48	3-39	1	--	Some of the numbers of samples disagree with the text on page 7-4 and with the data in Table 7-2.
49	3-40	1	---	Describe the use of data under each validation class. For example, the qualified data can only be used to indicate the presence of contaminants, and not to quantify the magnitude.
50	Figure 4-3			The fault symbol should be defined to indicate which block was uplifted relative to the other.
51	Figure 4-5			The data points used to generate the subcrop map should be included. Some comment applies to Figure 4-6.
52	Figure 4-11			Add boring A26-SB03 to the plot.
53	Table 4-1			Geologic Unit number 4 is not defined in the text.
54	4-25	3		The text should include a discussion of City of Houston water supply wells located east of the site, and any effects these wells may have on solute migration.

EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
55	Figure 4-11			The figure is exhaustive, yet unreadable. A larger scale map showing a smaller area would be more appropriate. The City of Houston water wells 1085 and 1086, located east of I-59 (present in the N. Cavalcade RI), are not identified on the Figure.
56	4-32	Table		The hydrogeologic units presented here should be related to the soil units discussed in Section 7. Page VI of the Executive Summary presents these relationships.
57	Figure 4-13			Analysis of Figure 4-1 and the inset on Figure 4-13 indicates a contact between the Lisse and Beaumont formations exists south of well OW01. The fence diagram should be revised to reflect this.
58	4-44	1	3	Identify which sample is from the deep aquifer.
59	5-7	last		This is awkward; it is already in Section 5. Reword the paragraph.
60	5-10	1	2	Replace "3-10" with "3-3".
61	5-10	3	3	Insert "Round 1 and Round 2" after "of the".
62	5-11 5-14 5-18 5-23	Tab 5-3 Tab 5-4 Tab 5-5 Tab 5-8		Split these tables to separate the water and sediment data. This will allow the tables to more closely follow the text. At present, it is awkward to keep flipping pages to understand the points made in the text.
63	5-17	1	4	Add a statement about bis(2-ethylhexyl)phthalate to show that it is also found in the blank, and is a likely sampling induced contaminant.
64	5-21	2	12	Replace "disclosed" with "observed".
65	6-1	2	2	Insert "the" before "character".
66	6-1	3	4	Add a sentence to identify the number of valid, qualitative, and invalid samples.
67	6-2	3	7	The text implies that both the geophysical anomalies map and the organic vapor headspace measurements were virtually ignored when generating the surficial soils anomalies map (Figure 3-3). Is this true?
68	6-3	4	3	Replace "was" with "were".
69	6-3 7-1 7-15 7-23 7-30	4 2 2 1 1	3 10 14 14 8	This sentence is unclear; it can be interpreted to mean that invalid data were used in the evaluation. Invalid data should not be used. We believe you mean to say that some qualitative data were used along with the valid data in the evaluation.

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EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
70	6-3	4	5	Identify the sample numbers within this sentence.
71	6-4	1	6	Replace "29 mg/kg" with "below the method detection level". Otherwise, the next sentence becomes contradictory.
72	6-5	Tab 6-1		Redo this table using units of mg/kg. This will better support the discussion on page 6-4.
73	6-9	Fig 6-1		The shading of the unpaved areas distracts from the surface and surficial soil staining areas. Remove the unpaved area shading unless it is essential for your discussion.
74	Section 6.4			Incorporate the results of the Cavalcade Contaminant Survey.
75	7-1	2		Objectives of the groundwater quality evaluation should also include: a. An evaluation of the extent of contamination b. Migration of compounds, both laterally and vertically. c. Evaluation of potential source areas.
76	7-2	2	8	Define "useable quantities" of groundwater and Units 1-4.
77	7-3	2		Add the validation status for the ground water samples.
78	7-4	2	4&6	Are the totals for ground water samples correct? You list 62 total samples with 22 total QA/QC samples. This gives 40 total field samples. On page 7-3 you list 60 samples.
79	7-4	2&3	--	The numbers of groundwater samples disagree with page 3-39 and Table 7-2.
80	Tab 7-1			List the hydrogeologic units, discussed in sections 7.6 through 7.7, next to each sample.
81	7-13	3	5	Add a sentence to state that these compounds are not likely contaminants at the creosote site.
82	7-16 7-16 7-23 7-24 7-30 7-31	1 3 2 1 2 2	1 4 3 9 3 2	We prefer that you use the number of locations where contamination was detected rather than the number of samples. One objective of the RI report is to identify the extent of contamination; the locations are a better indicator of extent than are the samples. "
83	7-16	1	4	Begin the sentence by stating "In the other X borings,".

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EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
84	7-16	3	6	Replace "no" with "no detected (10 ug/l)".
	7-24	1	11	" " " " " " "
	7-33	3	6	" " " " " " "
85	7-16	3	7	Begin the sentence by stating "In the other 12 wells,".
86	7-17	3	3	Replace "fairly well distributed" with "found".
	7-25	1	3	" " " " " "
87	7-18	Fig 7-1		Add the CDM well results.
	7-22	Fig 7-2		" " " " "
88	7-19	2	---	Add a figure to show the volatile compounds.
89	7-19	2	10	Insert the maximum CDM concentrations.
	7-21	1	9	" " " " "
90	7-19	3	1	The first sentence either belongs in the above paragraph
	7-27	2	1	or else should be a separate paragraph.
91	7-19	2&3		Restate when the previous samples were collected.
92	Section 7.7			Tables 7A-3 and 7A-4, referred to in the text, contain a number of samples that appear to be incorrectly assigned. Based on the Unit 2 and Unit 3 definitions given on page VI of the Executive Summary, the following Unit 2 samples should be assigned to Unit 3: A01-SB09-30, A03-SB03-21, A03-SB05-22, A05-SB01-19, A06-SB03-19 and A06-SB04-12. If the assignments are correct then a review of how Unit assignments were made would be appropriate.
93	7-25	1	16	Insert "which could account for the variation" after "location".
94	7-26	1	5	The second and third sentences in this paragraph say the same thing about each round of sampling. Why not delete "Round 1" from the second sentence, and delete the third?
95	7-26			The PAH comparison table should include duplicate results or the higher reported value of a duplicate pair.
96	7-28	2	4	Delete "at Monitoring Well SCK-MW11 and".
97	7-28	2	9	The review would be more easily conducted if the results were directly compared in a table.
98	7-30	3	4	Replace "100" with "10".
99	7-31	1	9	Define "useable quantities" of groundwater.

006309

EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
100	7-31	3	--	Compare the metal concentrations to the background for Unit 3. Although not an exact comparison, we believe the this background sample can also serve to indicate the background for Unit 4.
101	7-34	1	2	Insert "in CAV-OWO6" after "compounds".
102	7-34	3	--	Add the maximum values of the samples.
	7-34	4	--	" " " " " " "
103	7-35	2	--	In line 4 , reference a map to identify these areas, and in line 5, append "and had concentrations exceeding 1 mg/kg".
104	7-35	3	--	Add "There were xx of these borings."
105	7-36	3	--	This paragraph is unclear. We are not sure which area you are discussing. Reword to make it clearer.
106	7-36	1	--	The numbers in paragraph 1 do not correlate with Figures 7-3 to 7-5.
107	7-36	2		The three samples 2 should be identified. According to Tables 7A-3 and 7A-5, some of these samples were from borings outside of the site boundary. The final sentence of the paragraph contradicts what is stated in paragraph 3, and should be removed.
108	7-40	Bullets		Identify the levels of surrogate and laboratory responses
	7-41	Fig 7-6		which you used to determine the presence of contamination.
109	7-34	-------		Add a map and discussion for volatiles and metals.
	7-40	-------		" " " " " " " " " "
	xiv	-------		" " " " " " " " " "
110	7-43	1	2	Identify the method detection level.
	7-44	2	4	" " " " " "
111	7-45	3	--	Add the missing aquifer thicknesses.
112	7-46	1	--	Add the missing ground water volumes.
113	7A-1	-------		The units should be the same as in the text (mg/kg).
	7A-4	-------		" " " " " " " " " " "
	7A-5	-------		" " " " " " " " " " "
	7A-6	-------		" " " " " " " " " " "
	7A-9	-------		" " " " " " " " " " "
	7A-10	-------		" " " " " " " " " " "

006310

EDITORIAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
114	Appendix 7A			There appear to be errors in the validation status of A05-SB06-07, in the chromium and copper results of A10-SB04-08 and in some PAH results of A02-SB03-21, A03-SB01-11, A26-SB05-19, compared to Appendix Q, Volume 3.
115	Appendix 7B			The validation status of all samples is missing and the VOC results of MW01-001 and MW12-001 are missing. Appendix R, Volume 3 also indicates that Table 7B-5, samples MW12-001 are incorrectly reported. The sampling dates should be given on Tables 7B-13 and 7B-15.
116	8-2	-------		Add some discussion on data validation for air samples.
117	8-3	Tab 8-1		Add the time of day to the column headings.
118	8-12	2	13	The last part of the paragraph is confusing. One sentence states that it is impossible to evaluate collection efficiency whereas the next sentence says it is satisfactory. Reword to clarify the points you are making.
119	8-13	1	5	Replace "27" with "17".
120	8-13	1	6	Add "which have MEG's" after "investigated".
121	8-16	4	1	Replace "27" with "17".
122	8-16	4	1	Add "which have MEG's" after "analyzed".
123	8-16	4	2	Replace "limits" with "MEG's".
124	8-19	3	1	Define trace quantities as "less than 0.01 ug/M^3".
125	9-1	-	--	Reference the guidelines used to perform this preliminary PHEA.
126	9-4	3	8	The term "light aromatics" should be defined, in terms of a list of compounds.
127	9-5 9-6 9-9 9-10 9-12 9-13	Tab 9-1 Tab 9-2 Tab 9-3 Tab 9-4 Tab 9-5 Tab 9-6		The tables are missing means and some data, and are not consistent when reporting zero occurrences. We prefer that you use the same format for these tables as you used in the Texarkana RI report. -ditto- -ditto-
128	Tab 9-3 Tab 9-4			Unit 1-3 numbers do not track the data in Appendix Q, Volume 3 and with Appendix 7A. Explain on how these tables were developed.
129	9-11			Rephrase this section to clarify that the selected PCOC's are those compounds which were used at the facility. This also requires that the compounds related to historical operations be discussed at some location in Section 1.

006311

006311

EDITORIAL COMMENTS ON VOLUME 1 continued

No.	Page	Par	Line	Comment
130	Tab 9-5			Major discrepancies exist with Appendix R, Volume 3 Appendix 7B and this table. In addition, the higher reported value of a duplicate pair should be listed.
131	Tab 9-6			The numbers should be checked against Appendix R, Volume 3. Cadmium results here are incomplete.
132	9-15	Soils		The pathways for the trespassers also apply to the on-site workers. Fix the table to show this.
133	9-15 9-16 9-26	Sediment 2 Sediment	 2	Access is not restricted for all ditches. Therefore, the term "trespassers" is not completly accurate. We prefer the term "non-workers".
134	9-18	2	2	Replace "two areas" with "two detected areas".
135	9-19	2	2	Replace "both areas" with "both detected areas".
136	9-22	2	10	Reference the letter from USFWS.

006312

EDITORIAL COMMENTS ON VOLUME 2 OF THE DRAFT RI REPORT

No	Page	Par	Line	Comment
1	Appendix G			Add the 9/17/86 letter from James Campbell which requests the revised sampling program.

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EDITORIAL COMMENTS ON VOLUME 3 OF THE DRAFT RI REPORT

No	Page	Par	Line	Comment
1	A-6	Figure		The well log in Appendix F shows a clayey sand for SCK-P05 at 51 feet instead of a silty sand. The nearby boring A26-SB03 also shows a clayey sand at 51 feet.
2	C-1	1	3	Delete "general" and "generally".
	S-1	1	5	" " " "
	S-1	1	7	" " " "
3	C-2	Note 2		What is this describing?
4	C-3	2	---	Identify in this paragraph a high value from the data. This is needed for comparison to the low values discussed.
5	C-4	Table		The "zero" for zinc should be "4".
6	C-6	3	13	Insert "total aromatic hydrocarbons" after "samples".
7	C-11	1	1	The first part of the sentence is missing.
8	C-11	1	---	Show the data regarding the replicates.
	C-11	3	---	" " " " " "
9	E-9	Table		The data are missing from the table.
10	Appendix I			The shallow plot for 8/28/85 is either mis-dated or out of order.
11	J-13	Table		The sieve curve for SCK-P01 on page A-5 does not intersect the 10% line. Therefore, the Hazen approximation should be $<1.0\times10^{-6}$.
12	J-14	2	7	Replace "less" with "more".
13	Appendix L			Add the well records for wells 407, 408, and 438.
14	Appendix Q			Some of the unit number assignments appear inconsistent.
15	Appendix R			Add the validation status for each sample.
16	Appendix S			Is the 2-methylnaphthalene value for A13-SB01-10 (0.1800 ug/kg) correct? Also, the 2-nitrophenol and 2,4-dimethylphenol values disagree with Appendix R, Volume 3 for sample MW12-001. Which is correct?

006313

TECHNICAL COMMENTS ON VOLUME 1 OF THE DRAFT RI REPORT

No	Page	Par	Line	Comment
1	x	3		It is unclear why the conclusion was reached that no surficial contaminant source areas were disclosed given that soil staining was noted at a total of 44 boring locations.
2	1-1	-------		The section should include a discussion of the operational practices and compounds used in the former wood preserving treatment and tar distillation operations. This would give better perspective to the detected compounds that are discussed later in the report.
3	1-14	-------		Add a subsection which identifies the contaminants related to the historical operations and which were expected to be found onsite. You also need to briefly discuss the chemical and physical properties of these contaminants. The toxicological properties can be discussed in Section 9.
4	1-18	-------		Add a subsection which discusses the extent and nature of the contaminant problem. This is a required item under the 1985 RI guidance.
5	Figure 2-2			There is no topographic evidence for the pond area discussed on page 1-12 and indicated on Figure 1-5. Any reason for this?
6	Section 2.2.3			What effects would regional subsidence have on the aquifers and aquitards discussed in this report?
7	2-10	3	---	Do the cited hazardous waste releases affect the South Cavalcade site? Each incident must be identified in a table as to the location. I am particularly interested if there is a release of any contaminant for which you tested.
8	Section 3			The report does not indicate that any decontamination or rinseate samples were collected for laboratory analysis. The purpose of these samples is to verify the adequacy of the field decontamination procedures for all down hole equipment. Since this field quality assurance procedure was apparently not undertaken, there is no way to know whether the stated decontamination procedures (Sections 3.6.3, 3.6.2, 3.7.2) were adequate or if cross-contamination may have occurred.
9	3-12	1	--	How representative of soils contamination are the headspace measurements thought to be?

006314

TECHNICAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
10	Figure 3-3			An evaluation of Appendix C, Volume 2 and Figure 3-2 indicates that the surficial soils anomalies map may be incomplete. There are a number of auger borings in areas A01, A02, and A25 that had lab headspace readings greater than 100ppm (Appendix C), yet none of these boring locations reside within Area A or are depicted elsewhere on the Figure. The soil boring program (Section 3.6) also failed to investigate many of these anomalies. How do Areas A, B, C correspond to A01 - A28?
11	3-22	4		The text indicates that approximately 20 percent of the monitoring wells present on-site contain no bentonite seal between the sand pack and grout. In particular, wells P01, P02, P03, P04, P05 and MW23 have no bentonite seal above the well screen, possibly creating some interconnection of aquifers (see comments on Section 4). In addition, the cement-bentonite grout may have infiltrated into the underlying filter pack, affecting field permeability tests, water level monitoring and groundwater quality sampling results.
12	3-25	2	3	Was the turbidity of collected samples noted? How would not filtering affect the interpretation of the metals results?
13	Figure 4-4c			The figure shows that MW16 is screened in a sandy clay. The log for the well shows a clay. Therefore, are the data from this well meaningful? Note that this well alone causes the interpretation of a northerly flow on the southern side of the property (Figure 4-17, page 4-42).
14	Figure 4-4e			The figure shows that P05 is screened in a sandy clay. However, the well log shows a silty sand and a nearby boring shows a clayey sand. Therefore, do you believe the data from this well is meaningful? Note that P05 had the lowest hydraulic conductivity (two orders of magnitude) amongst all the borings tested in this aquifer (Table 4-7, page 4-43).
15	Section 4.2.7			The section is of general interest, but needs to have recharge rates quantified to be relevant to site hydrogeology.
16	Section 4.3.2			What is the estimated hydraulic conductivity or recharge potential through this aquitard?
17	Figure 4-13			The fence diagram (Figure 4-13) is highly generalized and infers lateral continuity of water-bearing zones, in conflict with the cross sections (Figure 4-4A through 4-4F) and numerous references in the text. Either note on the fence diagram that the diagram is a simplification of the local geology, or else delete the diagram.

TECHNICAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
18	4-32	2		No hydraulic conductivity data are presented for the shallow aquitard (average depth 0-10 ft.). This information is needed to assess infiltration and possible contamination of the shallow water-bearing zone.
19	4-34 4-39	4 3	5 6	Why did you only use the elevation data from November 30, 1987, in portraying the ground water flow? Is this date typical of the other dates, or of the average?
20	4-36 4-40	2 3	--- ---	Does this plotting program incorporate hydrogeolical principles? If not, then we cannot accept the plot as valid.
21	4-36	2		Comparison of the potentiometric surface maps (Figure 4-15 and Appendix I) with the base contour map of the shallow zone (Figure 4-5) indicates that groundwater is flowing up-dip (west) to a point where the shallow zone would become unsaturated approximately 1000 ft. west of the site. Is there an explanation for this?
23	4-36	3&4	--	Why do the groundwater contour maps in Appendix I, Volume 3 change after August 1986? It would be helpful to show the location of the leaky pipe on Figure 4-15. What is the estimated discharge rate of this pipe? How long has the pipe been leaking?
24	Section 4.3.4			How much water is estimated to leak through this aquitard? Is leakage upward or downward?
25	4-40	2		The wells used to construct potentiometric surface maps of the upper intermediate zone (Appendix I) are completed in stratigraphically discontinuous sand units separated by clays having hydraulic conductivity values of 10-9. Also, Figure 4-17 shows gradients to the west, based entirely on a water level measurement in Well MW23. All other maps of the upper intermediate zone show gradients do the east. Well MW23 has an anomalously high water level, possibly due to lack of a seal above the well screen. For these reasons, the potentiometric surface maps for the upper intermediate zone are meaningless.
26	4-40	3		Wells P01 through P05, used for falling-head field permeability tests of the upper intermediate zone, have no seal above the well screen. The test results vary by three orders of magnitude and are probably unreliable.
27	4-43	Table		How accurately can laboratory permeability tests be related to in situ aquitard (or aquifer) hydraulic conductivities? Is this aquitard thought to be a semi-confining or fully confining unit?

006316

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TECHNICAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
28	4-43	Tab 4-7		We am not convinced that the hydraulic conductivity for PO5 represents the upper intermediate aquifer. Nearby borings show clayey sand and sandy clay. The clays may account for the conductivity which is two orders of magnitude lower than the average of the other three wells.
29	4-45	3	9	The value used for effective porosity of silt and fine sand (0.35) is incorrect. Effective porosity (specific yield) of non-indurated silty sand is approximately 0.2. Using this value leads to ground water flow rates in the shallow zone of 38 ft./yr. Due to the unreliability of hydraulic conductivity measurements and potentiometric surface maps of the upper intermediate zone, groundwater flow direction and rate is unknown for this unit.
30	Figure 4-19			Is DW02 too far to the west to have a chance of capturing any potential contamination from the source areas? This figure suggestrs that we need a deep well to the east.
31	Section 4.3.11			It is unclear how valid the vertical gradient values are, based on the parameters presented in table 4-10. What is the range and standard deviation of the average water level and monitoring well depth values assigned to each zone? How were monitoring well depths calculated? Were they based on screened zones or sensing zones? Vertical gradients and supporting data for set of nested wells should be presented.
32	4-49	2	3	Vertical hydraulic conductivity values are typically much smaller than horizontal hydraulic conductivity values for a given strata. Was this taken into account when selecting the upper bound vertical hydraulic conductivity value?
33	Section 5.2.2			How were the flow directions estimated?
34	Table 5-3			The following comments apply to all data summary tables presented in Sections 5, 6, and 7 and Appendices 7A and 7B: a. Both sets of results for duplicate samples should be presented or, at a minimum, the higher reported value of a duplicate pair should be listed. b. Appendices P, Q and R of Volume 3 contain many J-qualified values. Although the quantitation of J-qualified compounds is uncertain, their presence in the sample is certain. Therefore, list all data and add the J identifier where necessary. c. The results flagged with asterisks on the summary tables have no similar notations in the Appendices. A discussion of how these are assigned should be included.

TECHNICAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
35	Section 5.3.4			Are there any conclusions regarding potential source areas or correlations with contaminated soils or groundwater?
36	5-21	2	14	The final statement on this page applies to zinc concentrations only; cadmium was detected at 50 mg/l.
37	5-21 vii	1 4	1 1	We disagree. All you have shown is that the water concentrations are no more than slightly above the drinking water criteria. However, you have not addressed toxicity to aquatic organisms. This could be a problem as shown below. It is premature to make any statement about significance of contaminant levels in the RI, and that this will be addressed in the FS.

Pollutant	Maximum Sample	EPA Chronic Criterion	Is It A Concern?
Arsenic	56	48	maybe
Copper	17	12	maybe
Lead	31	3.2	yes
Nickel	36	160	no
Silver	11	0.12	yes
Zinc	140	110	maybe

units in ug/l

38	Section 5.4.4			The term "detected" needs to be defined. The section should include discussion of potential source areas, relationship to surface water results, and comparison to background levels.
39	5-27 ix	3 2	4 1	We disagree with the inference about PAH concentrations in the sediments. The concentration of the background sample, SCK-SD11, is 7.7 mg/kg whereas the concentration of the highest sample, SCK-SD04, is 236 mg/kg.
40	5-27 ix	4 2	2 4	We disagree that metal concentrations reflect background conditions. Cadmium in SCK-SD03 and copper in SCK-SD04 are over double the background levels in SCK-SD05.
41	6-2 6-3	3 3	3 3	You are stating that the surrogate testing did not show contamination in areas with observable soil staining. Does this detract from the validity of the surrogate methods? Would residual contamination of surficial soils be expected at the site? Were the sampling and analytical programs adequate? Were enough samples collected?
42	6-3	4	5	How were the four on-site surficial soil samples that underwent analyses selected? The text must justify that 4 samples are enough to adequately characterize surficial soil quality of a 66 acre industrial site.
43	6-4	2	--	How were the four inorganic compounds selected as indicator compounds?

TECHNICAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
44	6-4	last		Is there any direct evidence to support the statement that geophysical anomalies are a result of fill materials placed on-site?
45	6-4 x 7-16 7-24 7-30	2 2 2 1 4	Table --- --- --- ---	Why is lead not listed? We understand that lead may not a typical contaminant at a creosote site, but the site data shows that lead was found in concentrations exceeding the background. Therefore, include lead in these tables. "
46	6-10	4	1	What do you mean by "significant"? Rephrase this paragraph to discuss the factual findings and not a judgement on findings. Significance will be discussed in the Feasibility Study report after the public health risk has been evaluated.
47	7-10	3	6	We do not agree that all four locations show "fairly consistent" results. Well MW-16 has chemical parameters which are much greater than the parameters for the other three wells.
48	Section 7.5			Given that MCL's or MCLG's exist for three of the detected volatile organic compounds, why aren't volatile organic results for groundwater discussed?
49	7-15	1	6	According to the soil boring location map (Figure 3-4), approximately one third of the 88 soil borings were collected off-site. Why then were only two soil borings chosen as being representative of background soil inorganic conditions?
50	7-16	1	1	Unit 1 is defined here as being greater than 6 foot depth. How appropriate is it then to compare soil inorganic results to a background sample (A27-SB01) that has a reported sample depth (Appendix Q, Volume 3) of 4 feet?
51	Section 7.6.1 Section 7.7.1			What are the conclusions regarding soil contamination? What is the distribution of compounds detected above background levels? How significant are these?
52	Section 7.6.2			Discuss that volatile organic compounds (excluding methylene chloride and acetone) were detected in 8 of the 18 shallow zone monitoring wells (Table 7B-2) and benzene concentrations were greater than 50 mg/l in 4 locations.
53	7-17	3	10	Were the non-aqueous phase liquids noted in Well CAV-OW11 lighter or denser than water? This has significant implications for solute transport.
54	7-19	1	11	Discuss the possible explanations for the differences in pentachlorphenol detection between the previous and the RI-related sampling results.

006319

TECHNICAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
55	7-20 7-27	2 3	-- --	How representative of groundwater inorganic chemistry are the results from nonfiltered metals samples? This comment also applies to Figure 7-2.
56	7-25	1	11	What could account for the order of magnitude decrease in PAH concentrations at well SCK-P03?
57	7-26	1	--	The occurrence of PAH compounds in all upper intermediate zone wells that have corresponding nested shallow zone suggests that cross-contamination while drilling the upper intermediate zone wells is a possibility. All possible PAH migration scenarios from the shallow to the upper intermediate zone, whether natural or man-induced, should be discussed.
58	7-29	1	--	Why are metals concentrations higher at the northern end of the site than the southern end?
59	Section 7.8.1			What is the relationship between the lower intermediate zone (silt zone) water quality and Unit 3 soil quality?
60	Section 7.9.1			It should be noted that 4 of the 5 Unit 4 soil samples discussed here are located outside of the site boundary. How applicable are the off-site results?
61	7-31	3	--	How do background concentrations compare to the inorganic indicator concentrations?
62	7-35			The table is missing many samples (A01-SB03, A01-SB04, A01-SB09, A03-SB03, A17-SB01) that contain PAH's and includes some samples collected outside the site boundary (A06-SB04, A08-SB02). Any reason for this? Also, why were borings A01-SB03, A01-SB09, and A03-SB05 not included in this analysis?
63	7-36	1	5	What about A10-SB01? This boring has the highest concentration in the southeastern area.
64	Fig 7-3 Fig 7-4 Fig 7-5			The origin of the data points on these figures is unclear. Why are some Unit 2 data points deeper than Unit 3 data points?
65	7-40	3	1	The method in which soil and groundwater results were composited needs to be explained in more detail. The validity of this approach should also be discussed.
66	Fig 7-6			The Unit 2 boundary contour drawn around borings A26-SB04 and A26-SB05 is inconsistent. Appendix Q, Volume 3 indicates the only detected PAH compound at either site is bis-(2 ethylhexyl) phthalate. Occurrences of this compound in other borings has been ignored. Also, why isn't well OW06 shown on the map? What are the implications of this map, given note number 4?

006320

TECHNICAL COMMENTS ON VOLUME 1 continued

No	Page	Par	Line	Comment
67	7-42	2	--	What accounts for off-site migration of PAH compounds to the southeast? According to Figure 4-6 and the groundwater contour maps in Appendix I, Volume 3, this is in the upgradient and updip direction. What conclusions can be made regarding VOC distributions?
68	Section 7.12			Why not identify the volume of soils associated with the contaminated ground water?
69	9-2	2	6	How were the J values used? How were the geometric means calculated?
70	9-2	2	--	Was there any correlation between areas of facility operations and areas of detected contamination? Such a correlation could be used to identify areas of potential exposure in the absence on analytical results.
71	9-7	1		What about surficial soils? Are these also of interest? What about future development which may result in breaching the paved areas? These issues must also be addressed.
72	9-11 xvii	3 4		Lead was found at concentrations exceeding the background. Why isn't it considered a PCOC?
73	9-11 Tab 9-10	last		The occurrence of PCOC's summary, item 2, is extremely misleading. VOC's were not analyzed for in soils so their occurrence in soils is unknown.
74	Tab 9-7			An exposure pathway to off-site workers and residential occupants due to off-site migration of surface water and groundwater should be included and evaluated. Also, the exposure to on-site workers is not only limited to dust; some of the compounds, especially benzene, can volatilize and thereby affect inhalation. These comments also apply to sections 9.4.1, 9.4.3, 9.5.3 and Tables 9-10 and 9-11.
75	9-20	2	--	The possibility of downward migration of denser than water NAPL around old or porrly completed wells should be addressed.
76	9-24 9-27 xxi	1	6	Some of the metals in the surface water exceed EPA chronic aquatic water criteria. We disagree with this statement in the report.

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TECHNICAL COMMENTS ON VOLUME 3 OF THE DRAFT RI REPORT

No	Page	Par	Line	Comment
1	A-1	Table		Explain why sample A14-SB03-19 has a hydraulic conductivity which is two orders of magnitude greater than the others from this aquitard.
2	C-1	1	1	What measure was evaluated? Were you evaluating the presence or magnitude of contamination? This paragraph implies magnitude; the statement discusses presence.
3	C-1	1	11	How was agreement on negative correlations used?
4	C-3	3	---	We do not believe you have sufficient data to make any statistically significant statement about x-ray fluorescence. However, we agree that your data and lack of data shows that x-ray fluorescence is not a proven method for this site.
5	Appendix I			We have problems with the manner in which these plots were drawn. The computer only fits curves to data. It does not provide hydrogeological interpretations. This becomes very evident in the figures where new wells are added. The additional information can radically change the interpretation of the data.
6	J-1			The hydraulic conductivity test procedure is questionable. If static water levels are above the top of the confined aquifer, the process of "saturating" the test zone is unnecessary and creates artificial static head (H).
7	J-2	Table		We have problems with SCK-P05. Part of the boring log from Appendix F shows a clayey sand. Nearby borings show a clayey sand (A26-SB03) and a sandy clay (A26-SB08).
8	J-3			The falling-head test results vary by more than an order of magnitude in each water-bearing zone.
9	J-12			The grain-size analyses in Appendix A indicate that Hazen approximations of hydraulic conductivity are not valid (10 percent passing must exceed 0.1 mm grain size).
10	J-14			Falling-head (slug) tests are limited by the material having the lowest hydraulic conductivity of the following: Well Screen Filter Pack Borehole Wall Formation near the well It is not possible to determine which of these hydraulic conductivities are being measured during a slug test. Therefore, the slug test may not truly determine the aquifer characteristics.

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TECHNICAL COMMENTS ON VOLUME continued

No	Page	Par	Line	Comment
11	Appendix S			Blank contamination is not discussed in the text. How was blank contamination incorporated into the evaluation of sampling results?
12	S-5	--------		Add a discussion on precision. This involves calculating a relative standard deviation (%RSD) and comparing it on a contaminant specific basis to the %RSD from the EPA CLP program. We have mailed you an EPA report which presents the CLP results and describes the methodology for calculating the %RSD.
13	Appendix S			The blank sample SW08-01 has a high lead content, but all of the inorganic data in Appendix P were portrayed as valid. Doesn't the high lead blank make the lead results only qualitative?

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